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Driver Education: Key to Better Highway Safety

WE FEEL a direct responsibility to our customers to promote highway safety in any way we can. In the last issue of SPAN, I mentioned the importance of detecting and repairing mechanical defects that develop in the normal use of automobiles.

Of the three key safety elements involved—the car, the driver, and the road—safety authorities generally agree that the driver himself is the major cause of accidents. As numbers of drivers soar, we are vigorously supporting efforts to insure that all are being properly trained. This is not the case at present.

During the school year ended in 1965, some 17,500 schools in the nation could have offered courses in driver education. Of these, not quite 12,000 gave what are termed qualified 30 and 6 programs, which call for 30 hours in the classroom and six hours of actual driving time. While 1,300 other schools offered some kind of driver education course, the total still reached only 76 per cent of the potential schools.

The figures for student participation are even less encouraging. Of almost 3 million eligible students, about 1.3 million actually took part in a qualified 30 and 6 course, and another 400,000 had other instruction of a less formal sort. These data indicate that 55 per cent of eligible students do not get the qualified 30 and 6 course, while 40 per cent get no driver education at all.

To protect both our present and future customers, we back 100 per cent participation in driver education programs. In the past, our support has taken several forms. Foundations financed by our companies have contributed to the Automotive Safety Foundation and the National Committee on Safety Education—organizations that promote more driver training. In addition, we have distributed to students more than a million copies of a booklet on driving tips. We also offer to schools, at cost, a series of eight movies illustrating driving emergencies.

But our interest does not end with the teen-age driver. Millions of motorists already licensed have never had any instruction in safe driving practices, or even the rules of the road. Most states today have no procedures to check whether a driver has suffered from some physical or mental disability after he has once received his license.

Some imaginative, innovative attention must be devoted to programs that will increase motoring skill and responsibility, if driving is to be made safer for all American motorists.

John E. Svecin
Chairman of the Board



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OUR COVER: Mr. Louie, the self-elevating drilling rig that had seen previous service in the Gulf of Mexico and later the German sector of the North Sea, was used to drill our first discovery well in British waters.

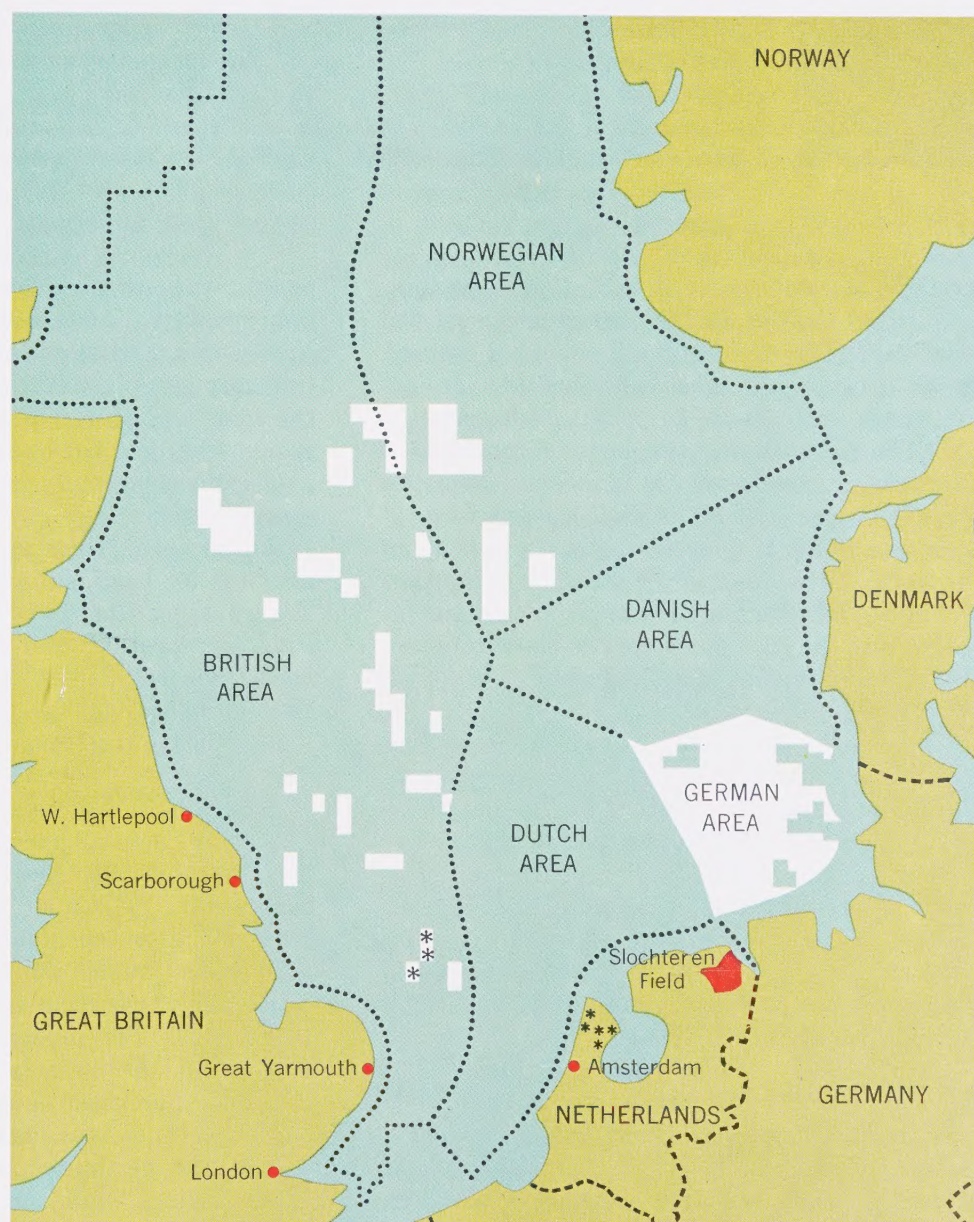
STANDARD OIL COMPANY ◀ INDIANA ▶

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The terms *company*, *we*, *our*, and *its*, as used in this magazine, sometimes refer collectively to the parent company and all of its subsidiaries, sometimes to one or more of them. The shorter terms are used for convenience and simplicity.

GAS DISCOVERIES IN THE NORTH SEA



Map of North Sea and its bordering countries shows offshore area of each. Areas where our subsidiaries and their partners have drilling rights are indicated in white. Asterisks locate our successful wells in the area—three in the British section of the North Sea and five on the Dutch mainland north of the city of Amsterdam.

UNDER THE DEPTHS of the stormy North Sea a new industrial chapter in a centuries-old history of conquest and commerce is being written by the probing drills of oil and gas explorers.

Of the five nations bordering the sea, energy-hungry Great Britain particularly hopes that adequate supplies of indigenous natural gas and crude oil will spur its economy, improve its living standards, and better its balance of payments. A number of successful natural gas wells drilled in 1966, three of them ours, offer some substance



Left: Months of seismic exploration throughout the North Sea preceded bidding and drilling. One boat sets off explosions while second boat records patterns of echoes bounced off sub-surface rocks.

Right: By correlating intensity of the seismic waves and time required for them to travel down and back, geologists mapped characteristics of the underground structure, such as on this seismic cross section.

to these aspirations of the United Kingdom.

Our own drilling in the British sector of the North Sea within the last few months has brought major discoveries that may develop into some of the most important in our corporate history.

The North Sea search was inspired by the 1959 discovery, at Slochteren, in Groningen Province of northeastern Holland, of what has since proved to be one of the two largest natural gas fields in the world. (The other is the great Hugoton field of Texas, Oklahoma, and Kansas.) Scientists investigating the geologic history of the Slochteren area decided other major fields might well exist under the North Sea.

The prize for finding them appeared substantial, for the soaring energy markets of densely-populated, industrialized Western Europe lay nearby, on all sides. Demand for oil and gas energy in the Common Market area was increasing at about 20 per cent a year in the early 1960's, although the pace has slackened recently. Yet, more than 90 per cent of the petroleum used in Western Europe has to be imported, most of it from the Middle East.

EXPLORATION TEAMS

In the early 1960's American International Oil Company, our subsidiary for operations outside North America, began its seismic exploration through other subsidiaries in most of the countries involved. Such exploration uses a seismograph to record echoes of explosions reflected off sub-surface rock strata, resulting in "pictures" of the formations below. To share the costs and risks of exploration and leasing over such large North Sea areas, our subsidiaries allied themselves with other U.S. and foreign companies.

In West Germany, Amoco Hanseatic Petroleum Company joined in a venture with several German and American companies. The group is

popularly known as the German Consortium.

In the Netherlands, Amoco Netherlands Petroleum Company became the operator for a three-company group conducting explorations both on the mainland and in the North Sea area. The group includes Holland's largest independent petroleum marketer and Germany's leading energy producer.

Our Amoco Norway Oil Company became operator for itself, subsidiaries of Texas Eastern Transmission Corporation and Amerada Petroleum Corporation, and for a group of leading Norwegian companies. The combined group is known collectively as the Amoco-Noco group. It is exploring the Norwegian sector of the North Sea.

Amoco U.K. Petroleum Limited, our British subsidiary, acts as operator for a group which includes the British Gas Council and subsidiaries of Amerada Petroleum Corporation and Texas Eastern Transmission Corporation.

The Gas Council, our major partner in British North Sea exploration and production, is, under British law, the monopoly distributor of gas throughout the country. It also is the semi-monopoly purchaser of all gas found.

These groups then conducted seismic exploration in the pertinent parts of the North Sea. Their findings would let them make intelligent bids for concessions when the time came, and later, intelligent decisions on where to drill.

Ten companies, including ours, also subscribed for data from an air-borne magnetic survey of the sea. The seismic maps made by our undersea explorers showed a number of structural traps. Three separate basins seemed to be indicated.

LICENSES

Before licenses could be awarded, the bordering countries had to decide among themselves who

owned what, then pass legislation on how to grant drilling rights.

Germany: The country's entire North Sea territory was originally awarded in 1964 to a consortium. We and nine other companies are equal members. At the end of 1964, our group had to turn back about 15 per cent that we considered less promising acreage. Our rights expire next November, but extensions may be granted.

Great Britain: Our group was awarded 36 blocks, totaling 2.1 million acres, in September of 1964. We hold 31 per cent interest in this acreage. In 1965, the Amoco-British Gas Council group was awarded 15 more blocks, totaling 739,000 acres, in which our interest is 22 per cent.

Denmark: Fifty-year rights to all drilling, mainland and offshore, were awarded in 1962, but the concession reverts to the state if no oil or gas has been found by 1972. We have no interest in the three-company consortium involved.

Norway: The Amoco group was awarded 10 blocks totaling 1,213,000 acres, in 1965. The concessions last six years at the initial rate, but may be continued at progressively higher fees each

year. Our company has 28.3 per cent interest.

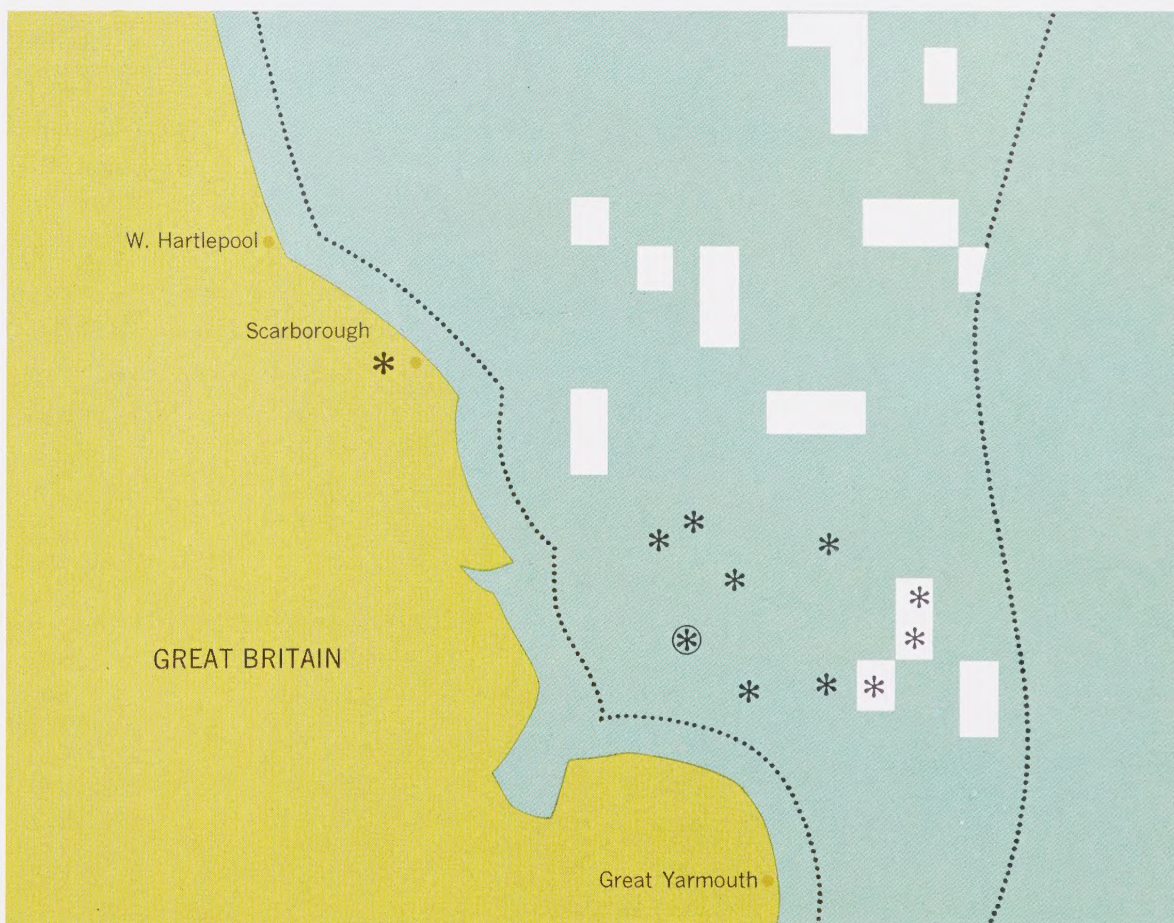
The Netherlands: In the country that provided the original impetus to the North Sea drilling race, offshore drilling has been delayed awaiting enabling legislation.

The Netherlands has a unique Napoleonic mining law that controls oil and gas operations on the mainland. A company that wants an exclusive concession must first discover the oil or gas before it can apply for rights. Even then, the government may award the production rights to another company, which then has to pay the discoverer a "fair recompense."

Because of the confusion caused by such an arrangement, the Dutch government decided to establish legislation governing its North Sea drilling under which exclusive rights would be granted before companies began drilling. It also decided to delay granting onshore concessions until North Sea conditions were determined.

Unfortunately, the legislation proposed by the government placed such heavy financial burdens on the producing companies that they indicated no desire to accept them. It is hoped that new

This is how the southern part of the British area looked at year-end. Our licenses are in white, and our three successful wildcats are in these areas. Other companies' discoveries are also shown by asterisks, including one on mainland west of town of Scarborough. Asterisk surrounded by a circle indicates the first oil discovery in British waters. Others are gas discoveries. West Hartlepool and Great Yarmouth serve as our shore bases.



Drilling for the German Consortium in the German North Sea area in 1964, jack-up rig Mr. Louie hit a pocket of nitrogen gas that blew out from below casing and bubbled harmlessly to surface. Well was later plugged and abandoned. Mr. Louie eventually drilled our first discovery well in British waters.



and more acceptable proposals will be advanced by the government this spring.

DRILLING

Our drilling in The Netherlands, therefore, has been confined to the mainland. In 1964 and 1965, we completed four wildcat wells as gas discoveries, plus one extension, in the province of North Holland, all within 100 miles, and southwest, of Slochteren field. Our interest is 60 per cent. The producing formation in our wells is the Rotliegendes sandstone, of lower Permian age, about 9,000 feet deep. This is the same formation—though not in the same field—that holds the enormous Slochteren reserves. We have applied for producing rights in all these fields. The wells have been shut in, awaiting decision on these applications.

In our large German offshore concession, 10 wells have been drilled. Several of them had shows of natural gas as well as large quantities of nitrogen, an inert gas. However, none is considered as commercial.

Our best North Sea success, and clearest prospect for significant production, is in southern British waters, where Amoco U.K. Petroleum Limited in a nine-month period of 1966 drilled three successful wildcats. One of the three apparently confirmed our participation in a field discovered earlier by another operator. Our other wells have found new reserves.

All are in Block 49, within 25 miles of each other, but none is within five miles of any other discoveries. The three wells lie in a nearly straight path northeast of our land base at Great Yarmouth, the closest 35 miles and the farthest about 60 miles from the base.

All three have been tested at rates of about 25 million cubic feet of gas a day, plus small amounts of distillate (like cigarette lighter fuel) on restricted chokes. All are in the Rotliegendes sandstone. Rotliegendes wells are between 7,000 and 9,000 feet deep. The gas, over 90 per cent methane, contains essentially no nitrogen or sulfur.

Our representatives are now engaged in negotiations with the Gas Council concerning the terms, including price, of an agreement for the sale of our gas.

"We've done over 10,000 miles of linear shooting with the seismograph, and we have drilled the most promising looking structures first," explains Ian Macartney, managing director of Amoco U.K. Petroleum, in commenting on our operations. He adds: "In general, the geology looks



Specially built for North Sea strains, jack-up rig Orion is towed to location to complete our second well in British waters. Later it drilled the third.

One of our successful gas wells in North Holland, the Schermer No. 3, flares gas during a test. Five such wells are shut in, pending action by the Dutch government.



better in the south and our locations are closer to shore."

Macartney, a veteran geologist with service for our company in Venezuela, Colombia, and Canada, points out that the North Sea has plenty of drilling problems.

NORTH SEA PROBLEMS

Fog, towering waves, wind, tidal currents, and even the possibility of World War II mines have to be coped with. Water temperature is about 34 degrees.

Already one drilling platform, the Sea Gem, contracted to a British oil company, has succumbed to North Sea conditions and joined the wrecks of hundreds of ships, some pre-dating the Spanish Armada, that lie on the bottom.

For safety's sake, we keep a boat beside our drilling rigs at all times. Helicopter service from shore is also available.

Our first discovery well, designated No. 49/18-1, was drilled from Mr. Louie, a self-elevating platform that had been in service in the Gulf of Mexico from 1959 until 1964, when it was towed across the Atlantic and used by the German consortium to drill in the German sector of the North Sea. It has 12 legs, each 233 feet long, and can drill in water up to 147 feet deep, with its platform hoisted 50 feet above the waves. After completing its first British well, Mr. Louie was moved 25 miles southwest to the site of No. 49/27-1, which was to be our second discovery.

While drilling at about 6,000 feet, the rig developed a crack in the metal housing of the jack-up mechanism, and was taken ashore for repairs.

Fortunately, a new jack-up rig, the Orion, built in Scotland for our use, was able to move into position, connect with the hole made by Mr. Louie, and continue drilling to successful completion at about 7,000 feet. The Orion then drilled the third discovery, No. 49/23-1.

Designed to withstand winds up to 115 miles an hour and waves up to 64 feet, the Orion can operate in 275 feet of water and drill wells to 20,000 feet.

Some of our northernmost North Sea prospects, however, are in water 300 feet deep. We may use a drilling ship to probe these structures. Meanwhile, Mr. Louie is again back in action.

Development wells, 30 degrees from vertical, will be drilled from multi-well platforms.

Pipelines to move gas from wells to shore will be costly and tricky to lay because of the water depths, wind and waves, the wrecks of centuries, and the unexploded ordnance material of two world wars on the sea floor. Later pipelines to still undiscovered fields may encounter even bigger problems because of the greater distances and depths involved. Pipeline engineers are coming up with new approaches and equipment to cope with these problems.

The prize appears to be well worth some additional problems. Macartney is confident our discoveries have tapped major gas fields.

	<i>Name of Group</i>	<i>No. of Our Partners</i>	<i>Operator</i>	<i>Our Interest</i>	<i>Acreage Holdings</i>	<i>Wildcat Wells Drilled</i>	<i>Commercial</i>
Great Britain	Amoco-Gas Council	3	Amoco U.K. Petroleum	30.77% 22.3%	2,100,000 739,000	3	3
Norway	Amoco-Noco	3	Amoco Norway	28.3%	1,213,000	0	0
W. Germany		9	Gewerkschaft Elwerath	10.45%	About 5,000,000	10	0
Netherlands (Mainland)		2	Amoco Netherlands	60%		5	4

New Directions for American Oil



Marketing-manufacturing subsidiary sees expansion in size, profitability

AMERICAN OIL COMPANY, our domestic subsidiary for manufacturing, distribution, marketing, and product research, is by far the best known of our operating companies.

As the fourth largest refiner and marketer in the United States, it has more than 23,000 employees. It sells directly to nearly that many jobbers and dealers. And, while no one can say for sure how many final consumers buy its products, our economists estimate nearly 16 million Americans buy some of them each year. Eight million persons, to cite something more tangible, are holders of American Oil credit cards.

Some 79 per cent of the consolidated company's net book investment in marketing is in the hands of American Oil—and 87 per cent of our nearly \$2 billion net product sales to trade in 1965 was generated by this company.

American Oil has 12 refineries, employing some 7,400 persons, who can process 808,000 barrels of oil a day into more than 2,000 petroleum-derived products.

There are gasolines, diesel fuels, motor oils, chassis greases, transmission fluids, and gear lubricants for automobiles; furnace oil, heater oil, and kerosene for the home and commerce; anhydrous ammonia and agricultural chemicals for the farm; general purpose oils and greases, cylinder oils, turbine oils, diesel oils, mining oils

and greases, rust preventives, and special purpose oils and greases for industry, and white oils, waxes, petroleum solvents, additives, petrochemicals, petrolatums, asphalts and road oils, liquefied petroleum gas, jet fuels, and floor products, for other users.

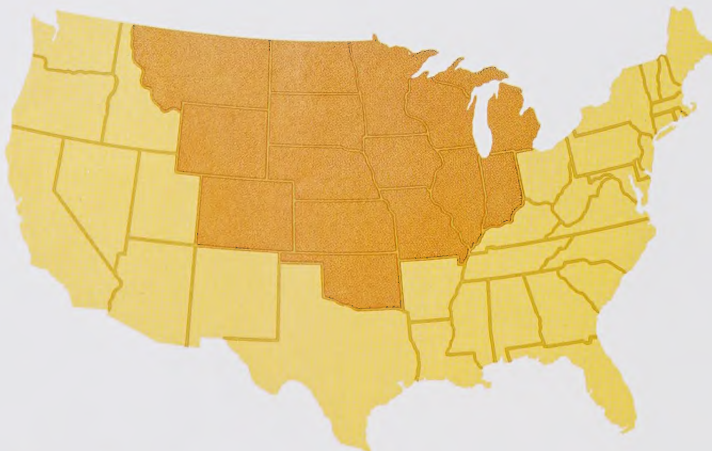
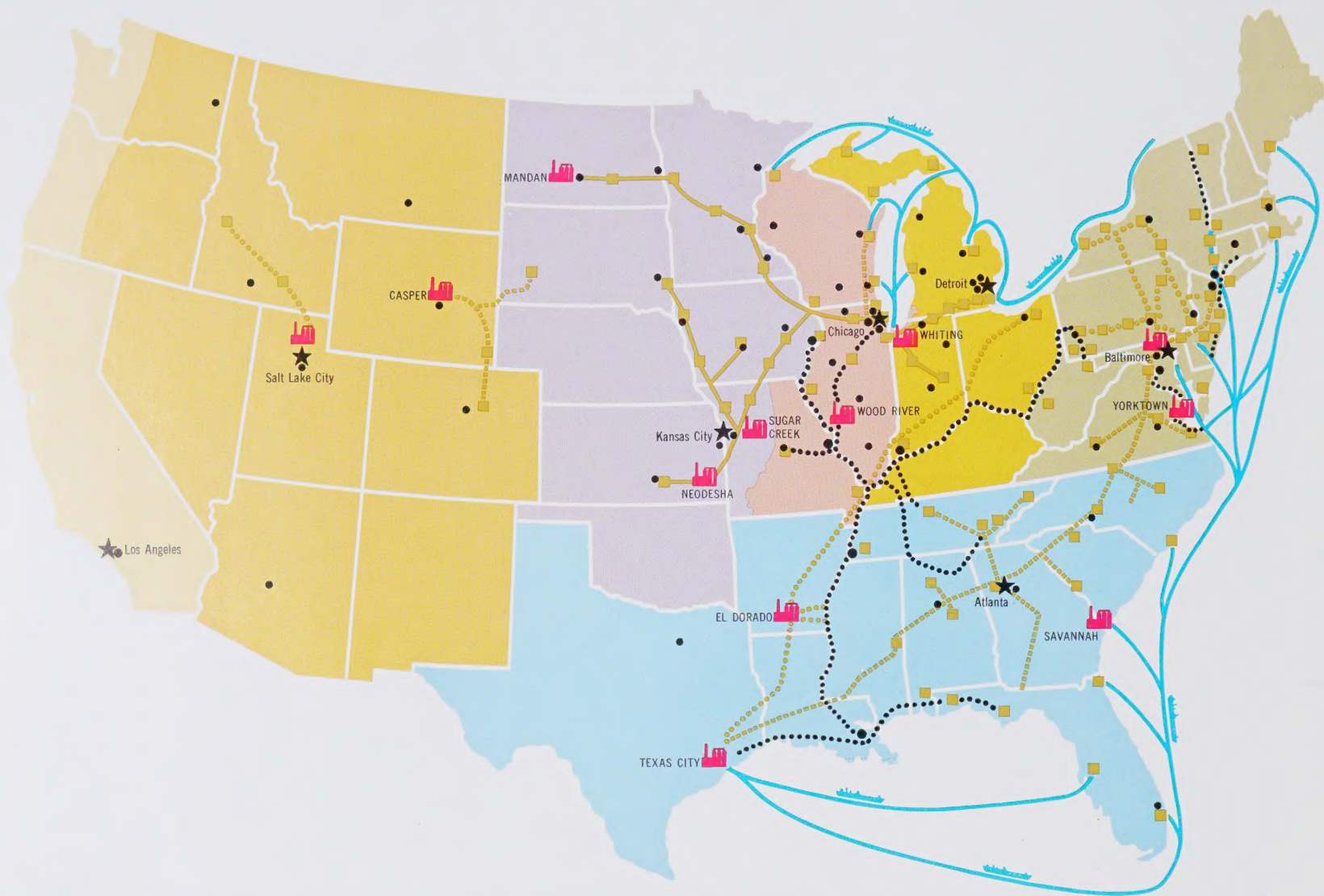
To get its products from refineries to terminals and warehouses, and then to service stations, factories, farms, and homes, American Oil uses a wide variety of transportation facilities: pipelines—including the largest system of privately-owned product lines in the nation—ocean and lake tankers, towboats and barges, railway tank cars, highway transport trucks, and tank trucks.

There are three main sales channels. The *reseller* channel markets to jobbers and dealers for eventual resale to motorists. These sales account for 85 per cent of American's marketing investment and by far the largest part of its profits. The *consumer* channel sells directly to farmers and homeowners, and accounts, on the average, for about 16 per cent of American Oil's profits. The *industrial* channel sells directly to commercial, industrial, and governmental accounts, markets about 43 per cent of the company's total product volume, and accounts for between one-fifth and one-sixth of profits.


Until the beginning of 1961, these functions were handled on a regional basis by three sep-



American Oil Management Committee members inspect materials for new Motor Club. Standing, left to right, are Marketing Vice President W. H. Miller, General Manager of Employee and Public Relations L. H. Butterworth, Administrative Vice President H. L. Boyle, President L. W. Moore, and Executive Vice President F. Cushing Smith. Seated are General Counsel E. L. Godshalk (left) and P. C. White, vice president, research and development.



-  American Oil Company
-  Standard Oil
Division of American Oil Company

- ★ Regional Offices
- District Offices
-  Refineries
- Products Pipelines, Wholly Owned
- Products Pipelines, Partly Owned
- Products Pipelines, Used but not Owned
- Tanker Routes
- Barge Routes
- Refined Products Terminals

American Oil Company markets in 15 Midwest states (indicated in dark shade on map at left) through its Standard Oil Division, a geographical entity often confused with the parent company. In these 15 states the name Standard appears within the Torch and Oval emblem. Elsewhere in the United States the name American appears within the emblem. Larger map, above, indicates, by different colors, the marketing territories of each regional office of American Oil, as well as its main operating facilities.

arate companies—American Oil in the East and South, the parent company in the Midwest, and Utah Oil Refining Company in the West. Consolidating these functions into one nationwide company gave sharp impetus to an improvement in profitability that is still being continued.

Now, convinced that expansion represents true growth only when it contributes to greater earnings, the company has increased its unit output, trimmed its unit costs and sought out profitable new opportunities on every front.

Though volumes have increased, the prime objective is increased earnings.

F. Cushing Smith, executive vice president of American Oil, has a simple explanation for part of the change: "A dollar in cost-reduction is a dollar contributed directly to profit."

Here are some of the ways American Oil has applied this idea in manufacturing:

Razing a number of obsolete, small units, and replacing them with fewer large modern ones; increasing the length of "runs" a unit makes by use of radiographic and ultrasonic inspections while it continues to operate, rather than shutting down for time-consuming visual inspections.

Applying improved technology and increased use of computers to get better yields of desired products and thereby reduce raw material costs.

Eliminating low-volume, high-cost products and uneconomic duplication of operations between refineries.

Installing modern continuous-line processing, treating, and blending equipment to reduce intermediate storage and batch operations.

Improving working methods, such as better planning and arrow-diagramming of the thousands of tasks involved in refinery "turn-arounds" and construction to minimize time lags.

Integrating processing units to eliminate transfer operations and reduce fixed costs.

Improved refining efficiencies have cut American Oil's costs by some \$43 million a year—and some recent technological breakthroughs promise considerably more in savings. These measures have also paid off in better products, greater productivity, and consequently, increased profits.

Transportation has seen similar cost-saving techniques. The main ones are the use of highly efficient, large-volume pipelines; construction of new terminals that allow drivers to load their trucks directly from the pipeline without intermediate storage; consolidating warehousing of packaged products; operation of terminals around the clock; conversion of tankers to higher capacities and new uses; supplying of some bulk plants



Proposed new American Oil dealer uniform, now being field-tested by more than 160 dealers, was designed by maker of the official U.S. uniforms for Pan American and Olympic games. Dealers' wives like its style and permanent-press fabric.

New design for motor oil cans strengthens identification of each with American Oil product line. Use of fibrefoil cans, produced at plant on Whiting refinery grounds, has reduced handling, packaging, and inventory costs some \$900,000 a year.



New ranch-style stations, accounting for a growing proportion of American Oil's capital investment in marketing, will have uncluttered, inviting appearance, softer approach on promotion.



Large-diameter pipelines such as the partly-owned Colonial Pipeline system, shown under construction, have helped American Oil cut the costs of transporting products to market.



and service stations directly by pipeline, and increased use of one-haul direct deliveries by trucks. Some equipment that used to lie idle part of the year is now switched to alternate use by season.

Improvements in marketing efficiencies, which started in the late 1950's, are steadily continuing to be introduced.

Under a new selective marketing concept, low-volume, obsolescent service stations have been razed or sold, and new high-volume stations have been erected on strategically selected thoroughfares and at prime interchanges on the Interstate Highway System. Many of the new stations are equipped to service long-distance trucks as well as passenger cars. American Oil ranks third in numbers of truck stops by brand name.

In a three-year period, American's number of retail outlets was *reduced* 13 per cent while gasoline sales to dealers was *rising* 13 per cent, and average volume per outlet rose 31 per cent.

Fully-integrated regional marketing offices have been consolidated, from 14 into six. Accounting and control functions have been consolidated and improved.

Marketing innovations are being tried continuously, some to be discarded, others expanded as they succeed in the market place. "The objective behind each is to give the customer a more complete package of travel convenience," explains William H. Miller, marketing vice president.

A trip-planning service, bolstered by on-the-spot travel advice at service stations, has made "As You Travel, Ask Us" one of the signs best recognized by the information-hungry motorist.

In the interest of one-stop service, American Oil service stations have been built adjacent to restaurants in many places on the Illinois and Indiana tollroads and near other Interstate Highway interchanges. Many of these restaurants are operated for us by the Fred Harvey organization.

The American Oil credit card, one of the most widely held in the nation, can now be used to pay for meals; lodging at Best Western/Best Eastern Motels and Pick Hotels and Motels; auto and accident insurance; American Oil Motor Club membership (see pages 16-18); and Avis automobile rental, as well as automotive products and services. Because its centralized credit card office already processes millions of billings each month for automotive products, it can bill the additional charges for these new services with little extra expense. By charging a billing fee to the businesses honoring its credit card, American Oil is able to reduce the cost of its own credit card operation, while passing on the benefits of lower costs to its customers.

Some other recent experiments American Oil has tested are coin-operated self-service stations, automatic car washes, global travel service by credit card, and a car repair clinic.

In consumer marketing, innovations have in-



Research and development, now organized on a project basis attuned to operating requirements, has a key role in finding better ways to develop new and improved products for an expanding market.

Amoco Connecticut, one of the tankers hauling American Oil products to market, approaches port. Specialized ocean fleet can cope with narrow channels and shallow docking facilities in many East Coast ports. They can move a gallon of gasoline 2,000 miles for about one cent.



cluded automatic fills of fuel oil (called "Keep Full" service) to relieve the homeowner of this responsibility, budget-plan payments, and a line of home comfort equipment—burners, furnaces, boilers, humidifiers, and air-conditioners—with company crews to service them.

Still an experiment, but rapidly increasing in number, is the American Oil farm service center, supplementing the traditional fuels and agricultural products with technical assistance in the use of fertilizers and agricultural chemicals.

American Oil has also pioneered the concept of Total Energy, using diesel fuel to generate electricity and capturing the "waste" engine heat to supply space heating, hot water, and even air-conditioning, at a savings compared with the cost of the same services purchased from utilities.

A key role in American Oil's newly increased profitability is that of the reorganized research and development department. P. C. White, vice president, points out, "We now operate on a project basis, closely attuned to the requirements of our operating departments or those of one of our sister companies. Our scientists are constantly striving to find better and less expensive ways to refine oil into products, and to make new and improved products and additives."

Research breakthroughs on the type and use of catalysts used in refining, for example, have opened the way to important savings in manufacturing. Our own designs for new types of re-

fining units give us wide leeway in our choice of equipment, as well as the opportunity for additional income through licensing our processes for use by other companies.

Working closely with a product development group in marketing, the research department provides new or reformulated products on an average of more than one a week. By monitoring automotive engineering developments in Detroit, American Oil research personnel anticipate requirements for new fuels and lubricants, and develop the products to meet the needs.

In recent years, these scientists have also developed techniques that open entire new markets for American Oil products. Some examples: Oil-fueled tobacco curing and flame cultivating, plus a subsurface asphalt barrier that retains the moisture from rain or irrigation in sandy soil for better farming.

Today, after six years of progress as our unified coast-to-coast marketer, American Oil has experienced, in the words of its president, L. W. Moore, "a real change for the better in its basic prospects for profitability." As a result, a major investment program is contemplated, in both manufacturing and marketing over the next several years. Already in the opening phase of expansion, American is concentrating on recruiting, training, and motivating thousands of top-calibre young people as the basic ingredient of long-term competitive advantage.

THE WORST WINTER in the history of Cook Inlet, Alaska, took place two years ago—in Tulsa, Okla. It raged electronically inside a digital computer at Pan American Petroleum Corporation's research center.

"We put decades of Cook Inlet weather data into the computer, together with results of our own studies of ice floes, tides, and other forces," explains George H. Galloway, executive vice president of our North American exploration and production subsidiary. "The computer then synthesized the information we needed to develop and test designs for offshore drilling and producing platforms. Such platforms, now in use, can withstand winters far worse than any we're ever likely to experience."

This is one example of thousands that prove, sometimes with shattering emphasis, that our company is intimately involved in the weather. Weather can't be controlled or avoided, but we do study and plan for it, to reduce its damaging aspects and enhance profits.

Weather affects the production and sale of our raw materials, the kinds of products we make and when and how we make them, how we move them and where, and who buys them.

Weather dictates many design factors of our facilities—our wells, the equipment that measures and ships oil and gas, the manufacturing units that convert them to products, and the marketing outlets that sell the products.

We operate in climates that range from arctic to tropical. In some areas we work where rainfall averages 12 feet a year; but in sections of the Sahara Desert, even the last decade of rainfall would not fill one of our geologist's canteens.

We're involved with weather in miniature—weather phenomena at or near the surface, called *micrometeorology*. It is the small but violent world that ants could explain if they wrote weather reports. It concerns extreme cold that can disjoin pipe or fracture concrete foundations. It is summer temperatures sometimes higher than 160 degrees that can sear the surface of storage tanks. (White paint and insulation are our chief allies in

Wea



ner—Friend and Foe

From the problems of weather we've found opportunities for profit



Wyoming ground blizzard at Pan American's Elk Basin field obscures vision.

Aid for a lady in distress comes in the form of an American Oil service truck, equipped to make repairs or tow a stalled car to a nearby service station. Members of the American Oil Motor Club get up to \$25 of such emergency road service free, as one club benefit.



Ice, riding the fast current and tides, chokes Cook Inlet, Alaska, surrounding Pan American Petroleum's drilling and production platform at its Middle Ground Shoal location.



combatting such tank-surface temperatures.)

Our concern with weather goes back to the beginning of animal life on earth, about 600 million years ago. "Fossil" weather (*paleoclimatology*) affected the abundance of organic material that later became oil and gas. It also influenced the location and size of oil and gas deposits we look for and produce today.

Today's weather affects everything we do. Despite our use of both U.S. weather bureau and private consultant reports and forecasts, we get stalled by the weather. Fog can paralyze offshore exploration and drilling or tanker and barge movements. Heavy rains, frozen rivers, and snow-clogged roads can hamper fuel and fertilizer deliveries just when demand hits its peak. Desert winds—the howling *shamals* of Iran, or *giblehs* of North Africa—can shut down exploration and drilling activities of our overseas subsidiary, American International Oil Company.

But sometimes bad weather is good, from our viewpoint: Severe cold is essential to our seismic exploration and wildcat drilling in some areas of Canada. Only when the marshy muskeg is frozen iron hard can heavy equipment move across it. And although drilling crews in the far North may have to stop working in "chill temperatures" of 80 to 100 degrees below zero, gas and fuel sales climb steeply. (Chill temperature is the sum of thermometer temperature and wind velocity; the chill temperature is minus 80 when the thermometer reads 50 below in a 30 mile-an-hour wind.)

Even metal weakens in extreme cold, and drilling derricks have been known to become brittle and collapse in severely low temperatures.

But again, cold spells rally the normally slower winter sales of our gasolines.

"People who ordinarily buy non-branded gasoline simply don't trust it in very cold weather,"

Warm summer weather and vacation travel bring a strong upsurge in gasoline demand. To meet it, American Oil schedules refinery processing units well ahead of time for the shift from cold-weather products. In all, American makes at least 70 different kinds of gasoline in an average year to meet climate and weather requirements across the nation.



explains William H. Miller, American Oil's marketing vice president. "They switch to our gasolines, knowing they're more likely to get fast starts and protection from icing.

"In fact, weather requires us to make at least 70 different kinds of gasoline every year instead of just two. We blend our gasolines to match the climates, seasons, and weather patterns of each section of the U.S. where the fuel is used."

American lubricating oils and greases are engineered for weather, too. Our newest and best multi-grade oil, 10W-40 American Super Premium LDO, protects engines in temperatures ranging from well under 20 below zero to far above 120. Our industrial customers enjoy similar "weather engineered" lubricants and fuels. And all our motorist customers benefit from weather aspects of services such as "As You Travel, Ask Us," the Chicago Travel Center, and seasonal programs in which our dealers prepare customers' cars for optimum performance. Conversely, sales of snow tires and anti-freeze have helped dealers weather many a storm.

Pipeline operations, the part of our business probably least affected by weather, are, nevertheless, not immune. Comments G. L. Maciula, engineering manager for Service Pipe Line Company, our subsidiary:

"Low temperature reduces the amount of oil that can be delivered through pipelines. During construction, heavy rain, wind, and frozen ground cause difficulties. We eliminate or minimize other potential problems on the drawing boards: Our facilities are designed and installed to withstand weather extremes. And, to meet emergencies, we have well-established procedures and standby equipment."

To Tuloma Gas Products Company, our agricultural fuels and fertilizers marketing subsidiary,

weather is the most important single fact of life.

K. V. Doughty, Tuloma's operations manager, declares that "a reliable two-week weather forecast covering the planting and harvesting seasons alone would be a major breakthrough for the fertilizer business."

Tuloma delivers virtually all of its fertilizers to farmers in the spring season, which begins in late February in the South and ends in July in the North. Tuloma must deliver the volumes of fertilizers needed to farmers in each area precisely when they are needed. Bad weather can complicate production, procurement, transportation, and storage operations required, or cut deeply into sales during the season.

To combat severe weather, our subsidiaries follow well-established procedures. Consider Pan American's actions when Hurricane Carla struck the Texas coast in September, 1961; the measures taken were typical of those by American Oil, Tuloma, and Service Pipe Line, also affected.

A plot of Carla's course was kept on maps at every operating location. Winds and tides were analyzed, plans laid, and employees informed of procedures to be followed. When Carla moved inland between Corpus Christi and Houston on September 11, company wells, processing units, drilling rigs, and other facilities in the storm's path had been shut down and secured. Employees and their families were safely away from the destruction.

The result: our installations were not seriously harmed. The greatest cost to us was in lost time and the oil, gas, and products not produced during that time—less than two days of interruption for most of our operations.

Although nobody can control the weather, our company finds ways to profit from it while reducing its damaging effects.



Now expanding nationwide, its rapid growth is boosting company and dealer business and profits

TRIP GUARANTEE, illustrated at right, is an exclusive of the American Oil Motor Club. If a member's car is disabled as a result of an accident 50 miles or more from his home, he can be reimbursed up to \$100, while his car is being repaired, for local lodging and meals, for rental car costs to continue his trip, or for payment of fares for commercial transportation to his destination.



UNTIL THIS MONTH, there were just two major motor clubs in the United States. Now there are three.

The new one is the American Oil Motor Club, a division of a new American Oil Company subsidiary, Amoco Enterprises, Inc.

With a network of authorized stations across the nation, American Oil Motor Club is already a major success and growing fast. For a low membership fee (\$12.50 a year), it provides members and their spouses with the basic benefits of most other clubs, plus several exclusive features.

Why did American form the American Oil Motor Club? William H. Miller, marketing vice president of American Oil, explains:

"Among the key marketing objectives of American Oil are to promote automobile travel, in-

crease the sales of our products, add new credit card customers, generate new business from inactive credit card accounts, produce more income for dealers, and, of course, provide additional profit for American Oil. The motor club was started because we believed it would substantially promote these objectives. The results prove that it already has."

Although the American Oil Motor Club is the only one of its kind sponsored by an oil company, American Oil regards it as a logical extension of its regular business.

"As an oil company," explains Miller, "we can offer our motor club members important advantages in terms of basic services available at thousands of our service stations coast-to-coast. No additional investment by American Oil is



EMERGENCY ROAD AND TOWING SERVICE covers labor expense at the place of disablement to get the member's car into operation, or to tow it if necessary, up to \$25 per call. Motor Club authorized stations are located throughout the country, but if one is not reasonably near, members can call any dealer for help and will be reimbursed.



PAYMENT FOR LEGAL DEFENSE reimburses a member up to \$475 if he hires a lawyer to defend him in an ordinary traffic violation. The amount, based on the traffic charge involved, is paid whether the member wins or loses the case.



American Oil Motor Club's management includes, left to right, Al Neumann, insurance and claims; Richard Willhite, membership; William Vehmeier, motor club manager; and John Hartigan, administrative.



required at the stations to serve our members.

"Most important, the motor club enhances the usefulness and versatility of our credit cards, of which some 8 million are now in circulation. These cards must be used to be useful to our customers or our company."

Initially offered in early 1965 to motorists in downstate Illinois and the eastern two-thirds of Missouri only, the motor club was so successful that it was approved for nationwide expansion in June, 1966. By November, the national headquarters for the club was established at 111 W. Jackson Blvd., in Chicago, and a direct-mail advertising campaign began.

The success of the American Oil Motor Club is based, in part, on the fact that early members helped design it. They were sent an eight-page

OTHER BENEFITS OFFERED MEMBERS ARE SHOWN BELOW

MEMBERSHIP CARD and Motor Club emblem identify member and his car. Emblem, for bumper, is reflectorized. Membership card is shown authorized station dealers for emergency road and towing, check cashing, and other benefits.

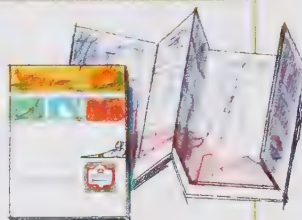


ARREST BOND CERTIFICATE, on back of the member's membership card, is good for bail of up to \$200. If member is arrested for an ordinary traffic violation, he presents the certificate to the arresting officer and continues on his journey. If court levies fine, motor club pays the fine and, in turn, bills member for the amount paid to the court.



CAR THEFT PROTECTION offers a \$200 reward for information leading to the arrest and conviction of anyone stealing a member's car. Window sticker on member's car warns would-be thieves that vehicle is protected by reward.

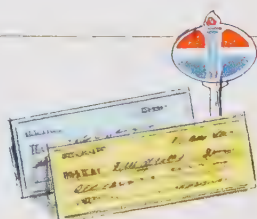
PATHFINDER PERSONAL TRAVEL PLAN provides member with touring and trip service tailored to his specific desires. It includes an 84-page atlas, routing for scenic or fastest way, as requested. Plan also includes special touring attractions, with descriptive literature.



FREE TESTING SERVICE for the brakes, headlights, and wheel alignment of members' cars is provided at any authorized American Oil Motor Club station equipped for testing, as listed in directories.

TRAFFIC AND TRAVEL ACCIDENT INSURANCE protects both member and spouse with up to \$1,500 accidental death or dismemberment coverage while traveling anywhere in the world. They are protected while driving, riding, flying, even walking. With the renewal of membership, coverage increases.

EMERGENCY CHECK CASHING SERVICE is available to members for personal checks up to \$25 at any Motor Club authorized station. Member shows his card to dealer to get service.



TRAVEL AGENCY SERVICE is available to members, arranged through "Ask Mr. Foster" Travel Service. Ask Mr. Foster plans travel, reserves lodgings, arranges individual or group tours, as requested.



"ADVENTURE ROAD" MAGAZINE informs members of exciting places to travel, tips on making motoring more enjoyable and economical, important news on legislation affecting motoring. It is issued four times a year.

questionnaire that asked for their opinions of the motor club and how it could be improved. Their answers also helped American Oil Motor Club experts in planning brochures and advertising.

Says William H. Vehmeier, manager of American Oil Motor Club: "We received 34 per cent return on our detailed questionnaire, or triple the response ordinarily expected in surveys of this type. This suggests the kind of interest that members have in the motor club. About 93 per cent of our responding members were highly favorable to the motor club. The only area of dissatisfaction—and it was small—was that the club was too localized. We're taking care of that through our national expansion program. Authorized dealers, now several thousand strong, are located throughout the country, with more joining all the time."

American Oil Motor Club authorized station dealers, who must meet high standards to qualify for motor club certification, report an increase in customers, sales, and profits. "Drop-in" business, as well as steady customers, are on the rise at their service stations.

Of the 12 basic benefits provided members of our motor club (see accompanying illustrations for a description), one in particular is regarded as especially valuable by members—emergency road and towing service. American Oil Motor Club's plan features unique advantages, compared with other clubs.

"Our emergency road and towing service provides direct contact between the member and the dealer," explains Vehmeier. "Our motor club members don't have to go through a central telephone dispatcher when they need assistance. They call our dealers directly, meaning that help will come to the right place with the right equipment needed to get the motorist on his way again quickly.

"And, our members have the freedom to call any service station or garage for help if no authorized station is readily available."

American Oil Motor Club also provides exclusive benefits such as the "trip guarantee," and emergency check cashing service, in addition to other benefits that are common to most other motor clubs.

Says Vehmeier: "Benefits offered by American Oil Motor Club are based on careful research into what motorists want and need from a motor club. We think our club offers more benefits for less money than any other, through being tied to our credit cards and our established expertise in serving motorists."



SOYBEANS



COTTON



WHEAT



*Its Crop-Mate
fertilizers open
new opportunities
in the booming
agriculture market*



Farmer Roland Garrett, left, discusses corn crop with W. R. Peirson, president, center, and R. J. Hunt, vice president of Tuloma.

OATS



BORGHUM; CORN AT RIGHT





Tuloma's new terminal near Peoria, Ill., stores up to 2.5 million gallons of fertilizer. Bob Gifford is terminal superintendent.

THE SURGING DEMAND for food is causing a rapid growth in chemical fertilizer sales. There are two types, dry and liquid. Liquids have many advantages, but have not been available in volumes to supply more than a small part of the market. The reason has been technological problems in their manufacture, and a shortage of agricultural phosphorus suitable for liquids.

Now we have developed a new process that allows us to make efficient use of a large, long-term supply of agricultural phosphorus, a source of liquid fertilizer raw material. We have obtained such a supply. As a result, we expect to expand substantially our position in the fertilizer market.

To take advantage of its new technology, Tuloma Gas Products Company has embarked on a major building and marketing program. It has introduced a new, complete line of liquid fertilizers under the "Crop-Mate" brand. Its new "Crop/Guide" marketing program is designed to serve all the farmer's fertilizer needs, and includes soil testing and farm management consulting services.

The Crop/Guide program and Crop-Mate liquid fertilizers are now available throughout the Corn Belt of mid-America and in Georgia and Texas.

"A fertility program, liquid or solid, supplies basically three nutrients essential to the healthy growth of plants," explains R. E. Dunn, Tuloma's manager of planning and market research. "These are the primary nutrients nitrogen, phosphorus, and potassium, in the form of potash—the N, P, and K on packaged fertilizers.

"As a liquid fertilizer company, we foresaw a severe shortage of the phosphorous raw material needed to manufacture our products, and a future that would either have restricted our growth as a full-line fertilizer marketer, or forced us to turn to dry fertilizers, the other type sold.

"Fortunately, our experimental work aimed at

reacting or mixing anhydrous ammonia, our source of nitrogen, with an alternate and large potential source of phosphoric acid, proved to be successful. This led us to contract for a large supply of the new material, an order which caused the manufacturer to build a new manufacturing plant to satisfy our requirements. And it meant that we could embark on our new liquid-mix program."

Tuloma's breakthrough was developed in 1965, at its fertilizer plant in Irvington, Iowa, by company scientists and engineers. The men responsible are Clarence Mullen, coordinator of process research, Henry McCandless, manufacturing coordinator, Penny Naquin, regional operations manager, and Al Ries, process engineer.

The new process permits the year-round blending of anhydrous ammonia and phosphorus, with water, to form a stable, long-lasting base liquid mixture containing 10 per cent nitrogen and 34 per cent available phosphorous. Because this solution can be made and stored for long periods, Tuloma can avoid most of the peak-load difficulties ordinarily encountered by fertilizer companies during the brief spring fertilizer application season.

The base solution is also used in combination with potash, to formulate two other mixes. These and a high nitrogen solution are hauled by truck from Tuloma mixing plants in the farm areas to retail outlets.

The four liquid solutions can be applied directly or mixed in any desired ratio to meet specific needs of every soil and crop. The liquids are applied by Tuloma specialists from Tuloma-designed applicator trucks—an important point to farmers, now experiencing a labor shortage.

"Although we hold about 18 per cent of national liquid-mix fertilizer sales," explains W. R. Peirson, Tuloma's president, "this has amounted to having about the largest share of a small market; liquid-mix fertilizers accounted last year for only about 3 per cent of all fertilizers sold. Nevertheless, liquids-fertilizer sales grew 59 per cent in 1966, and 40 per cent the year before. Our position in this market in terms of technology, supply of raw materials, marketing outlets, and a capable marketing organization is excellent."

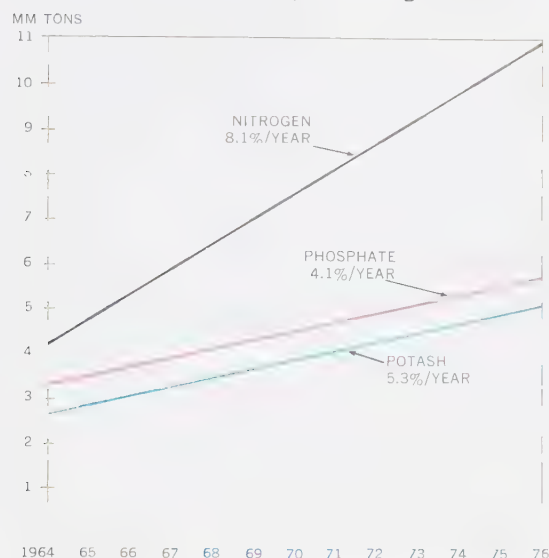
To expand its new Crop/Guide plan and Crop-Mate liquids, here's what Tuloma is doing:

1. It will nearly triple its production of anhydrous ammonia, from over 800 tons a day currently to about 2,300 tons by the spring of 1968, when its new 1,500-ton-per-day plant at Texas City begins operating. No single plant in the world is larger.

2. It has secured a large, long-term supply of phosphoric acid.

3. To transport growing volumes of fertilizer

PROJECTED GROWTH of primary nutrient use is shown below. For every pound of chemical fertilizers applied, farmers can harvest as much as 10 additional pounds of grain.



150 bushels of corn per acre requires	
From rain and/or irrigation	
Water	8 million lbs
From the air	
Oxygen	10,200 lbs.
Carbon	7,800 lbs
From the soil—Primary nutrients	
Nitrogen	310 lbs
Phosphorous/phosphates	172 lbs.
Potassium/Potash	450 lbs
From the soil—Secondary Nutrients	
Calcium	58 lbs.
Magnesium	50 lbs
Sulfur	33 lbs.
From the soil—Micronutrients	
Iron	3 lbs
Manganese	0.45 lbs.
Boron	0.10 lbs
Zinc	Trace
Copper	Trace
Molybdenum	Trace

materials, Tuloma is adding new refrigerated-ammonia river barges to its existing fleet of four to carry ammonia from Texas City to our four storage terminals in the heart of the Corn Belt. It is also expanding its leased railway tank car fleet to haul phosphoric acid.

4. To expand its marketing capability, Tuloma will construct 14 new phosphoric acid-ammonia conversion facilities, and add two more 30,000-ton ammonia storage facilities at distribution terminals. It will increase its retail outlets by 115, to a total of 751—all by the end of 1968.

5. It is expanding its lines of fertilizers and agricultural chemicals as well as services to farmers at its retail outlets. The Crop/Guide plan embraces all aspects of the farmer's fertilizer needs, from soil analysis to credit.

With the new program, Tuloma will expand from its prime market in the Corn Belt to other regions, particularly the South and Southeast, and to other crops, including cotton, sugarcane, soybeans, sorghum, pasturage, and wheat.

Why did Tuloma decide to invest in liquid fertilizers, instead of dry mixes or blends?

"It boils down to profit potential, both for us and our farm customers," explains R. J. Hunt, vice president. "Farmers will switch to new products and methods if we can show them better profit potential. Our new liquid-mix line has the kind of potential farmers are looking for.

"At the same time, Tuloma knows liquids best because we've always been primarily a liquid fertilizer company. We have no large investment in dry facilities, as most of our competitors do, so we have a freer choice to meet the future, and we think liquids are clearly superior. Liquids facil-



Marjorie Hoffman, technician, makes soil tests at Tuloma's Goodfield, Ill., laboratory.

ities require a lower investment than dry fertilizers, and liquids are cheaper to store, ship, and handle. Finally, liquids offer potent agronomic and economic advantages to the farmer.

"Our test marketing program points up the advantages of Crop-Mate fertilizers over competing types," Hunt points out. "Farmers rated our liquids as the easiest and most convenient to use. They found the nutrients are dispersed evenly throughout the mix, not unequally distributed as often occurs in dry-blended types. As application of secondary nutrients increases—sulfur, magnesium, and calcium—liquids again should be preferred over dry types.

"The seven micronutrients essential for healthy plants are better dispersed in liquids, and consequently more evenly distributed in the soil and more readily utilized by the plant roots.

"Chemical pesticides are also more conveniently added to and uniformly dispersed in liquids. This can save separate applications of these chemicals, speeding up seed planting."

The potential market for chemical fertilizers is enormous, spurred by an exploding world population and rising demand for more and better food. U.S. agriculture is supplying a steadily increasing volume of world food demand.

U.S. farmers continue to increase crop yields, chiefly by applying more fertilizer. Even so, the U.S. Department of Agriculture estimates that on the average, the nation's farmers are using only about 40 per cent of the fertilizer volume recommended by their state agricultural colleges.

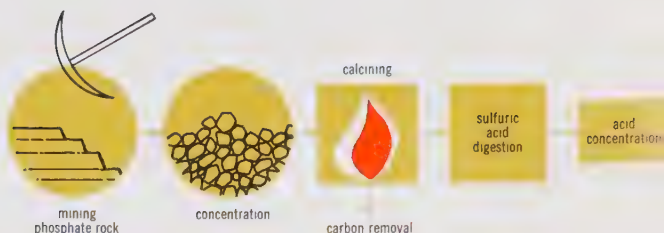
Newer varieties of wheat with shorter, stronger stalks may substantially expand fertilizer use on this major crop. Tuloma plans to expand its outlets into some irrigated wheat areas.

"Only about 7 per cent of earth's total land area is now suitable for crops in any one year," says Tuloma's President Peirson. "Bringing previously unfarmed land into production has not been too successful, and requires an investment most underdeveloped countries can't afford.

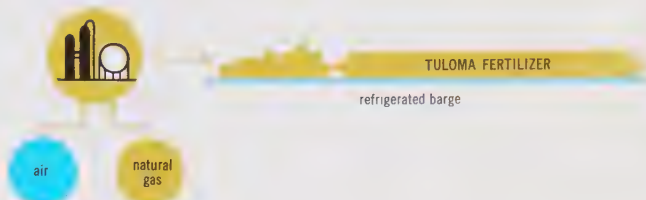
"Thus, more food must be grown on existing cropland, particularly in the United States, to help meet rising food needs. Fertilizers are the prime factor for increasing per-acre crop yields. All this has brought a boom in fertilizer sales.

"Tuloma is in an excellent position to grow rapidly in this growing industry."

PHOSPHORIC ACID PRODUCTION



ANHYDROUS AMMONIA PRODUCTION



This typical Tuloma retail outlet is at Saunemin, Ill.



**FERTILIZER MIXING PLANT OPERATIONS
AMMONIA-PHOSPHORIC ACID CONVERSION**

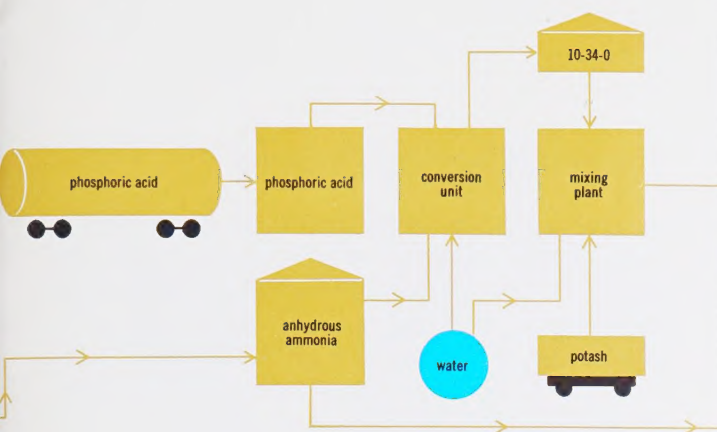
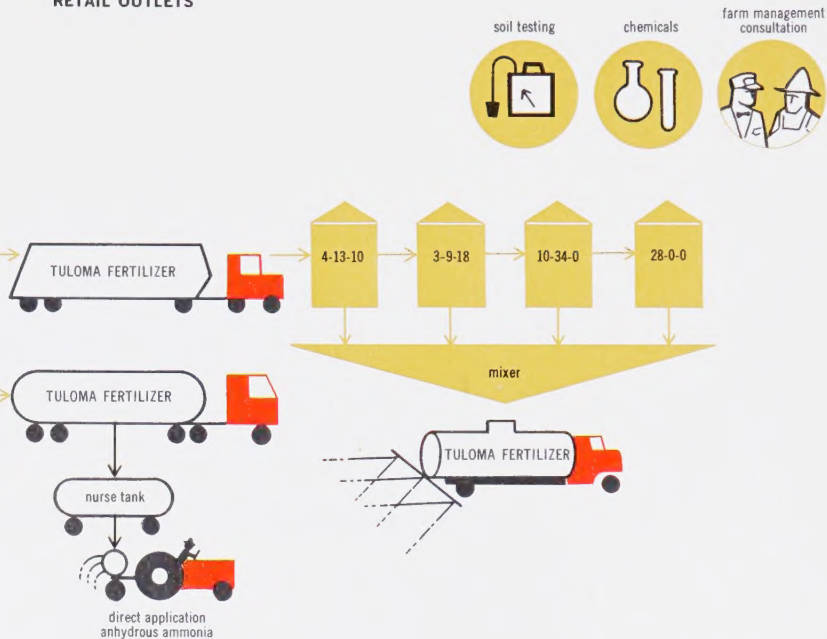


DIAGRAM SHOWS TULOMA'S new fertilizer operation. Anhydrous ammonia supply will increase by 1,500 tons daily when new plant at Texas City goes on stream in spring of 1968. Phosphoric acid, provided by long-term contract with another company, is reacted with ammonia to produce 10-34-0 base solution, from which other liquids are blended. These, as well as ammonia, will be sold at more than 750 retail outlets by early 1969.

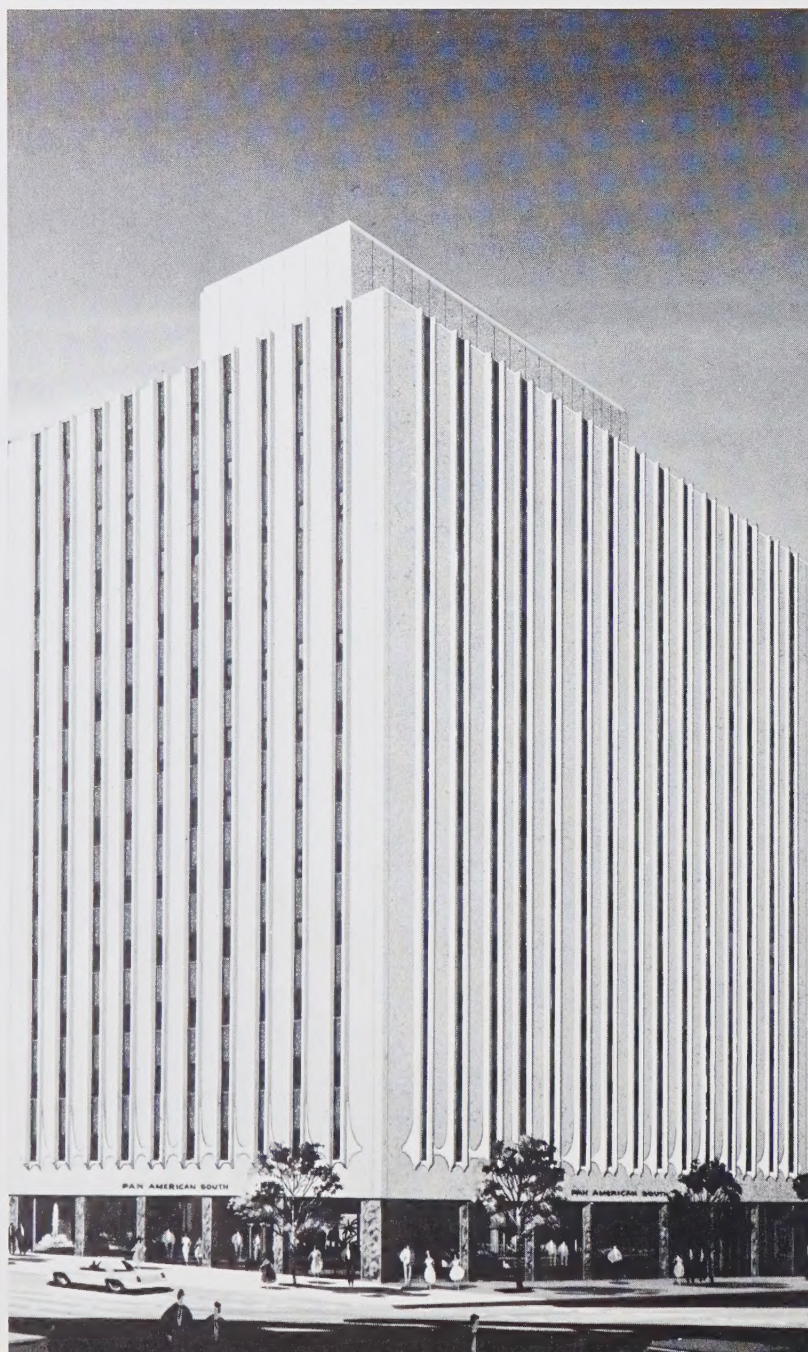
RETAIL OUTLETS



Wilbur Newell, Tuloma plant manager, checks pattern of liquids spraying on corn stubble from Tuloma truck.



BRIEFS *about our business*



Largest Tankers Ordered

American International Oil Company, our subsidiary for operations outside North America, has given Mitsui Shipbuilding and Engineering Co., Ltd., of Tokyo, an order for two 68,000-deadweight-ton tankers for 1968 delivery.

The 790-foot-long vessels will each be able to carry about 550,000 barrels of crude oil. They will be used primarily to haul crude oil from our Persian Gulf and Gulf of Suez oil fields to our refineries in Italy and Australia.

Discovery in Northwest Canada

Gas flow rates of up to 18 million cubic feet a day from 410 feet of section have been tested by a wildcat, 100 per cent owned by Pan American Petroleum Corporation, in the Pointed Mountain region of Canada's Northwest Territories. The discovery is 26 miles north of British Columbia and 30 miles northeast of our large gas reserve at Beaver River. Pan American Petroleum leases about 1 million acres in the new area.

Other recent discoveries by Pan American include three in the Oklahoma portion of the Anadarko Basin. Two were gas strikes—a full-interest well $3\frac{1}{2}$ miles from the nearest production in Canadian County, where we have 3,650 acres in the immediate area, and a 75 per cent-interest well in Blaine County, where we have about 2,480 acres surrounding the discovery. The oil was discovered in a 27 per cent-interest well in Blaine County.

In Texas, Pan American had a full-interest gas discovery five miles from production in Harris County; 50 per cent interest in a gas-condensate discovery 30 miles from production in Henderson County; and 50 per cent of a new field gas discovery in Kenedy County.

We also had a full-interest dual zone oil discovery 15 miles from the nearest production in Wayne County, Miss., and 50 per cent interest in an indicated gas-condensate discovery 45 miles offshore of Iberia Parish, La.

◆ *What's New in Tulsa*

Scheduled for completion next fall, a new office building in downtown Tulsa (artist's conception at left) will house some 850 employees of Pan American Petroleum Corporation. The building adjoins headquarters of Pan American and two of our other subsidiaries, Service Pipe Line Company and Tuloma Gas Products Company.



Petrochemical Construction

Construction proceeds at Decatur, Ala., (above) where Amoco Chemicals Corporation is building a complex of petrochemical plants. Latest to be announced at Decatur is a 200-million-pound-a-year paraxylene plant scheduled for completion in 1968. Paraxylene is a chemical feed stock used in making raw materials for the manufacture of polyester fibers and films.

Amoco Chemicals also plans to build a 50-million-pound-a-year trimellitic anhydride (TMA) plant at Joliet, Ill., for completion in mid-1968. TMA is used in plasticizers, alkyd resins for coatings, epoxy curing agents, and chemical intermediates.

1966 Foundation Grants

Standard Oil (Indiana) Foundation in 1966 made educational grants totaling about \$1,000,000 to more than 100 universities and liberal arts colleges. The institutions may use the unrestricted grants for any educational projects, except endowment. This brings to a total of more than \$1.6 million the 1966 grants to education by Standard Oil (Indiana) Foundation, American Oil Foundation, and Pan American Petroleum Foundation.

Nuclear Oil Shale Test Studied

Pan American Petroleum Corporation has joined with a number of other companies to plan and negotiate a field research test using a nuclear device in Colorado's oil shale.

Expand Wharf Plant at London

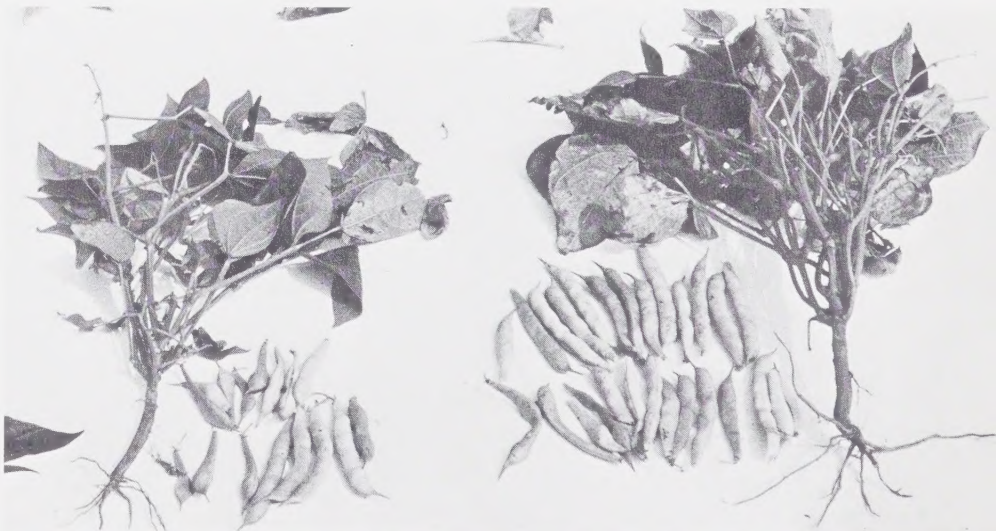
Amoco (U.K.) Ltd., completed a project to expand, modernize, and mechanize its Manhattan Wharf plant, at Silvertown, London. The project included installation of blending facilities and high-speed can-filling and packaging machinery for a full line of greases and lubricants.

New Booklet About Company

A color-illustrated booklet, "Standard Oil Company (Indiana) Today," was recently published. It is designed primarily to acquaint those unfamiliar with the Company with the scope of our operations throughout the world. Shareholders may obtain a copy by writing to Earl W. Russell, Secretary, Standard Oil Company (Indiana), P. O. Box 5910-A, Chicago, Illinois 60680.

Develop Portable Refining Trainer

American Oil Company has developed a computerized portable trainer to instruct employees in refinery process operations. The trainer requires only eight minutes to show simulated operations of a regular eight-hour refinery shift.



Asphalt Makes the Crops Bigger

Spreading thin layers of asphalt two feet below the surface, scientists of American Oil and Michigan State University have turned sandy, dry soil into prolific farm land where moisture is held available for crop roots. In the picture above, sample bean crops from untreated (left) and treated areas show dramatic difference.

STANDARD OIL COMPANY

< INDIANA >

910 South Michigan Avenue

Chicago, Illinois 60680



Landsaped early-American-design service station near University of Florida campus at Gainesville indicates American Oil Company's willingness to work with local officials for harmonious architecture. Operations of our marketing subsidiary are described in article beginning on page 1.